

WHAT IS CLAIMED IS:

1. A refrigerant cycle apparatus comprising: a refrigerant circuit constituted by successively connecting a compressor, a gas cooler, throttling means, and an evaporator,

wherein the throttling means includes a plurality of capillary tubes, refrigerant circulation into each capillary tube is controlled so that a flow path resistance of the throttling means is variable, and the flow path resistance of the throttling means at the time of the starting of the compressor is reduced.

2. The refrigerant cycle apparatus according to claim 1, wherein the throttling means comprises: a first capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of the first capillary tube, a valve device for controlling the refrigerant circulation into each capillary tube is disposed, and the refrigerant is passed into the second capillary tube at the starting time of the compressor.

3. The refrigerant cycle apparatus according to claim 1, wherein the throttling means comprises: a first capillary tube; and a second capillary tube which is connected in parallel to the first capillary tube and whose flow path resistance is smaller than that of the first

capillary tube, a valve device for controlling the refrigerant circulation into the second capillary tube is disposed, and the refrigerant is passed into the second capillary tube at the starting time of the compressor.

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4. The refrigerant cycle apparatus according to claim 1, 2, or 3, wherein the flow path resistance of the throttling means is reduced or the refrigerant is passed into the second capillary tube for a predetermined time 10 from the starting of the compressor.

5. The refrigerant cycle apparatus according to claim 1, 2, or 3, wherein the flow path resistance of the throttling means is reduced or the refrigerant is passed 15 into the second capillary tube from when the compressor is started until a temperature of a refrigerant in the refrigerant circuit reaches a predetermined value.

6. The refrigerant cycle apparatus according to claim 1, 2, or 3, wherein the flow path resistance of the throttling means is reduced or the refrigerant is passed into the second capillary tube from when the compressor is started until a temperature of a space to be cooled by the evaporator drops to a predetermined value.

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7. The refrigerant cycle apparatus according to claim 1, 2, 3, 4, 5, or 6, wherein carbon dioxide is used

as the refrigerant, the compressor includes first and second compression elements driven by a driving element, the refrigerant is sucked into the first compression element from the low-pressure side of the refrigerant circuit and compressed, and the refrigerant discharged from the first compression element and having an intermediate pressure is sucked into the second compression element, compressed, and discharged to a gas cooler.

10           8. A refrigerant cycle apparatus comprising: a refrigerant circuit constituted by successively connecting a compressor, the apparatus further comprising:

15           the throttling means including a plurality of capillary tubes; and a control device for controlling refrigerant circulation into each capillary tube and a rotation number of the compressor.

              wherein the control device controls the refrigerant circulation so that a flow path resistance of the throttling means is variable, and

20           the control device reduces the flow path resistance of the throttling means to raise the rotation number of the compressor, when a temperature detected by a sensor is not less than a predetermined value, and increases the flow path resistance of the throttling means  
25           to lower the rotation number of the compressor, when the temperature drops from a set value based on an output of the sensor for detecting the temperature of a space to be

cooled by the evaporator.

9. The refrigerant cycle apparatus according to  
claim 8, wherein the throttling means comprises: a first  
5 capillary tube; and a second capillary tube which is  
connected in parallel to the first capillary tube and whose  
flow path resistance is smaller than that of the first  
capillary tube, the control device is connected to a valve  
device for controlling the refrigerant circulation into  
10 each capillary tube, and the control device controls the  
valve device so as to pass the refrigerant into the second  
capillary tube, when the temperature detected by the sensor  
is not less than the predetermined value and to pass the  
refrigerant into the first capillary tube, when the  
15 temperature drops below the set value.

10. The refrigerant cycle apparatus according to  
claim 8, wherein the throttling means comprises: a first  
capillary tube; and a second capillary tube which is  
20 connected in parallel to the first capillary tube and whose  
flow path resistance is smaller than that of the first  
capillary tube, the control device is connected to a valve  
device for controlling the refrigerant circulation into the  
second capillary tube, and the control device controls the  
25 valve device so as to pass the refrigerant into the second  
capillary tube, when the temperature detected by the sensor  
is not less than the predetermined value and to pass the

refrigerant into the first capillary tube, when the temperature drops below the set value.

11. The refrigerant cycle apparatus according to  
5 claim 8, 9, or 10, wherein carbon dioxide is used as the refrigerant, the compressor includes first and second compression elements driven by a driving element, the refrigerant is sucked into the first compression element from the low-pressure side of the refrigerant circuit and compressed, and the refrigerant discharged from the first compression element and having an intermediate pressure is sucked into the second compression element, compressed, and discharged to the gas cooler.  
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15 12. A refrigerant cycle apparatus comprising:  
a refrigerant circuit constituted by successively connecting a compressor, a gas cooler, throttling means, and an evaporator; and

a control device for controlling a flow path resistance of the throttling means and a rotation number of the compressor,  
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wherein the control device reduces the flow path resistance of the throttling means to raise the rotation number of the compressor, when a temperature detected by a sensor is not less than a defined temperature at any of  
25 +29°C to +35°C, and increases the flow path resistance of the throttling means to lower the rotation number of the

compressor, when the temperature detected by the sensor is lower than the defined temperature based on an output of the sensor for detecting the temperature of a space to be cooled by the evaporator.

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13. A refrigerant cycle apparatus comprising:

a refrigerant circuit constituted by successively connecting a compressor, a gas cooler, throttling means, and an evaporator;

10 a control device for controlling a flow path resistance of the throttling means and a rotation number of the compressor; and

15 an internal heat exchanger for exchanging heat between a refrigerant discharged from the gas cooler and a refrigerant discharged from the evaporator,

20 wherein the control device reduces the flow path resistance of the throttling means to raise the rotation number of the compressor, when a temperature detected by a sensor is not less than a defined temperature at any of +29°C to +35°C, and increases the flow path resistance of the throttling means to lower the rotation number of the compressor, when the temperature detected by the sensor is lower than the defined temperature based on an output of the sensor for detecting the temperature of the refrigerant 25 discharged from the internal heat exchanger via the evaporator.

14. The refrigerant cycle apparatus according to  
claim 12 or 13, wherein the temperature of a space to be  
cooled by the evaporator is set in a range of -2°C to +7°C.

5           15. The refrigerant cycle apparatus according to  
claim 12, 13, or 14, wherein the throttling means  
comprises: a first capillary tube; and a second capillary  
tube which is connected in parallel to the first capillary  
tube and whose flow path resistance is smaller than that of  
10          the first capillary tube, the control device is connected  
to a valve device for controlling the refrigerant  
circulation into each capillary tube, and the control  
device controls the valve device so as to pass the  
refrigerant into the second capillary tube, when the  
15          temperature detected by the sensor is not less than the  
defined temperature, and to pass the refrigerant into the  
first capillary tube, when the temperature is lower than  
the defined temperature.

20           16. The refrigerant cycle apparatus according to  
claim 12, 13, or 14, wherein the throttling means  
comprises: a first capillary tube; and a second capillary  
tube which is connected in parallel to the first capillary  
tube and whose flow path resistance is smaller than that of  
25          the first capillary tube, the control device is connected  
to a valve device for controlling the refrigerant  
circulation into the second capillary tube, and the control

device controls the valve device so as to pass the refrigerant into the second capillary tube, when the temperature detected by the sensor is not less than the defined temperature, and to pass the refrigerant into the 5 first capillary tube, when the temperature is lower than the defined temperature.

17. The refrigerant cycle apparatus according to claim 12, 13, 14, 15, or 16, wherein carbon dioxide is used 10 as the refrigerant, the compressor includes first and second compression elements driven by a driving element, the refrigerant is sucked into the first compression element from the low-pressure side of the refrigerant circuit and compressed, and the refrigerant discharged from 15 the first compression element and having an intermediate pressure is sucked into the second compression element, compressed, and discharged to the gas cooler.

18. A refrigerant cycle apparatus comprising: a 20 refrigerant circuit constituted by successively connecting a compressor, a gas cooler, throttling means, and an evaporator,

wherein throttling means includes a plurality of capillary tubes, refrigerant circulation into each 25 capillary tube is controlled so that a flow path resistance of the throttling means is variable, and the flow path resistance of the throttling means is increased at the time

of the starting of the compressor.

19. The refrigerant cycle apparatus according to  
claim 18, wherein the throttling means comprises: a first  
5 capillary tube; and a second capillary tube which is  
connected in parallel to the first capillary tube and whose  
flow path resistance is smaller than that of the first  
capillary tube, a valve device for controlling the  
refrigerant circulation into each capillary tube is  
10 disposed, and the refrigerant is passed into the first  
capillary tube at the starting time of the compressor.

20. The refrigerant cycle apparatus according to  
claim 18, wherein the throttling means comprises: a first  
15 capillary tube; and a second capillary tube which is  
connected in parallel to the first capillary tube and whose  
flow path resistance is smaller than that of the first  
capillary tube, a valve device for controlling the  
refrigerant circulation into the second capillary tube is  
20 disposed, and the refrigerant is passed into the first  
capillary tube at the starting time of the compressor.

21. The refrigerant cycle apparatus according to  
claim 18, 19, or 20, wherein the flow path resistance of  
25 the throttling means is increased or the refrigerant is  
passed into the first capillary tube for a predetermined  
time after the starting of the compressor.

22. The refrigerant cycle apparatus according to  
claim 18, 19, or 20, wherein the flow path resistance of  
the throttling means is increased or the refrigerant is  
5 passed into the first capillary tube from when the  
compressor is started until a temperature of the  
refrigerant in the refrigerant circuit reaches a  
predetermined value.

10 23. The refrigerant cycle apparatus according to  
claim 18, 19, or 20, wherein the flow path resistance of  
the throttling means is increased or the refrigerant is  
passed into the first capillary tube from when the  
compressor is started until a temperature of a space to be  
15 cooled by the evaporator drops to a predetermined value.

24. The refrigerant cycle apparatus according to  
claim 18, 19, 20, 21, 22, or 23, wherein carbon dioxide is  
used as the refrigerant, the compressor includes first and  
20 second compression elements driven by a driving element,  
the refrigerant is sucked into the first compression  
element from the low-pressure side of the refrigerant  
circuit and compressed, and the refrigerant discharged from  
the first compression element and having an intermediate  
25 pressure is sucked into the second compression element,  
compressed, and discharged to the gas cooler.